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CONSTRUCTION COSTS OF ONE-STORY COMMERCIAL AND INDUSTRIAL BUILDINGS

THE cost of construction labor, including various fringe benefits, has risen steadily over the years. However, within the last five to six years, new materials, techniques, and methods have changed considerably, so that construction costs have not risen proportionately to the cost of labor.

This situation has caused us to take a close look at the construction costs of recently completed commercial and industrial structures in order to present a more accurate basis for estimating the reproduction cost of this type of construction.

On pages 353 and 354 we have set up a chart. The red lines show the costs of various types of exterior walls, including footings, foundation, masonry or metal walls, windows, exterior doors, plaster on the inside of the exterior walls (in some instances), and gutters and downspouts. This is based on a building with a 12-foot ceiling height. For instance, a building of that height and a 13-inch masonry wall (four-inch face brick, eight-inch concrete block backup, and three-quarter-inch plaster finish on the interior face of the wall) will cost $57.62 per running foot, and so in a rectangular 40-foot by 60-foot building (200-foot perimeter) the exterior walls will cost $11,524.

The blue line shows the cost of all other items in the building except interior partitions, plumbing and heating, and/or air conditioning. Thus, the blue line indicates cost of the concrete floor slab, asphalt tile, electrical work (except power wiring), ceiling, roof structure, insulation, roof decks, and roofing. The cost per square foot on these items averages $3.86.

In order to use this chart, one applies the appropriate building area, using the blue scale at the bottom of the chart, reads up to the blue line, and then traces that intersection horizontally to the dollar price scale on either the right or the left side of the chart. The perimeter is similarly entered on the red scale at the base and applied against the appropriate red line, depending on the type of wall construction. This chart is unique in that a logarithmic scale has been used horizontally as well as vertically in order that smaller perimeter and base area costs may be read more accurately.

Using this method, the cost of a 40-foot by 60-foot building with a perimeter of 200 feet and an area of 2,400 square feet will cost (200 feet x $57.62 + 2,400 square feet x $3.86) $11,524 + $9,264, or $20,788. The cost of partitions, plumbing and heating (computed from table for additional costs on page 356) must be added to this amount. By using the chart, it is possible to read the cost of the exterior walls and the floor, roof, ceiling, etc., directly off the appropriate lines.

It is prudent to point out that the unit costs used to determine the costs indicated are based on fair market prices and not on highly competitive costs that can be obtained when work is short. A ten percent differential can easily enter the picture with sharp competition. However, these factors vary with the times and are not considered in preparation of these costs.

The specifications note that this hypothetical building has clear span bar joists; in order to allow more versatility for this method, a future bulletin will have a table that shows the comparative costs per square foot of various types of roof structures.

It is a commonly accepted premise that as the size of a building increases, the cost per square foot decreases. This is due to several factors:

1. As the size of the building increases, the ratio of exterior wall to floor area generally decreases.

2. The contractor is able to operate more efficiently in contracting a large building.

3. The cost of materials is reduced because of lower shipping costs and lower unit overhead due to the quantity. However, it should be noted that unit labor cost reaches a minimum point.

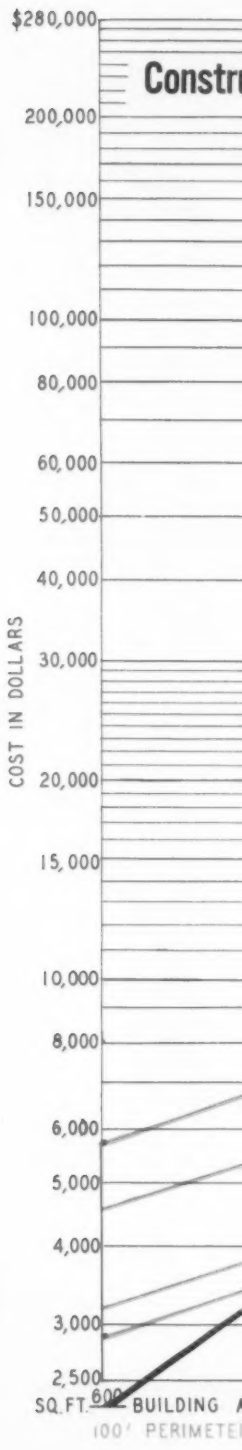
The charts we have prepared reflect this pattern. Consequently, the unit cost per square foot of floor area as the building gets larger shows this reduction. Incidentally, this reduction factor does not enter the unit costs on the exterior walls to the degree that it does on the floor area.

The specifications for the type of building covered by these charts are as follows:

1. Reinforced concrete footings, foundation and slab. Required grading based on relatively level site.

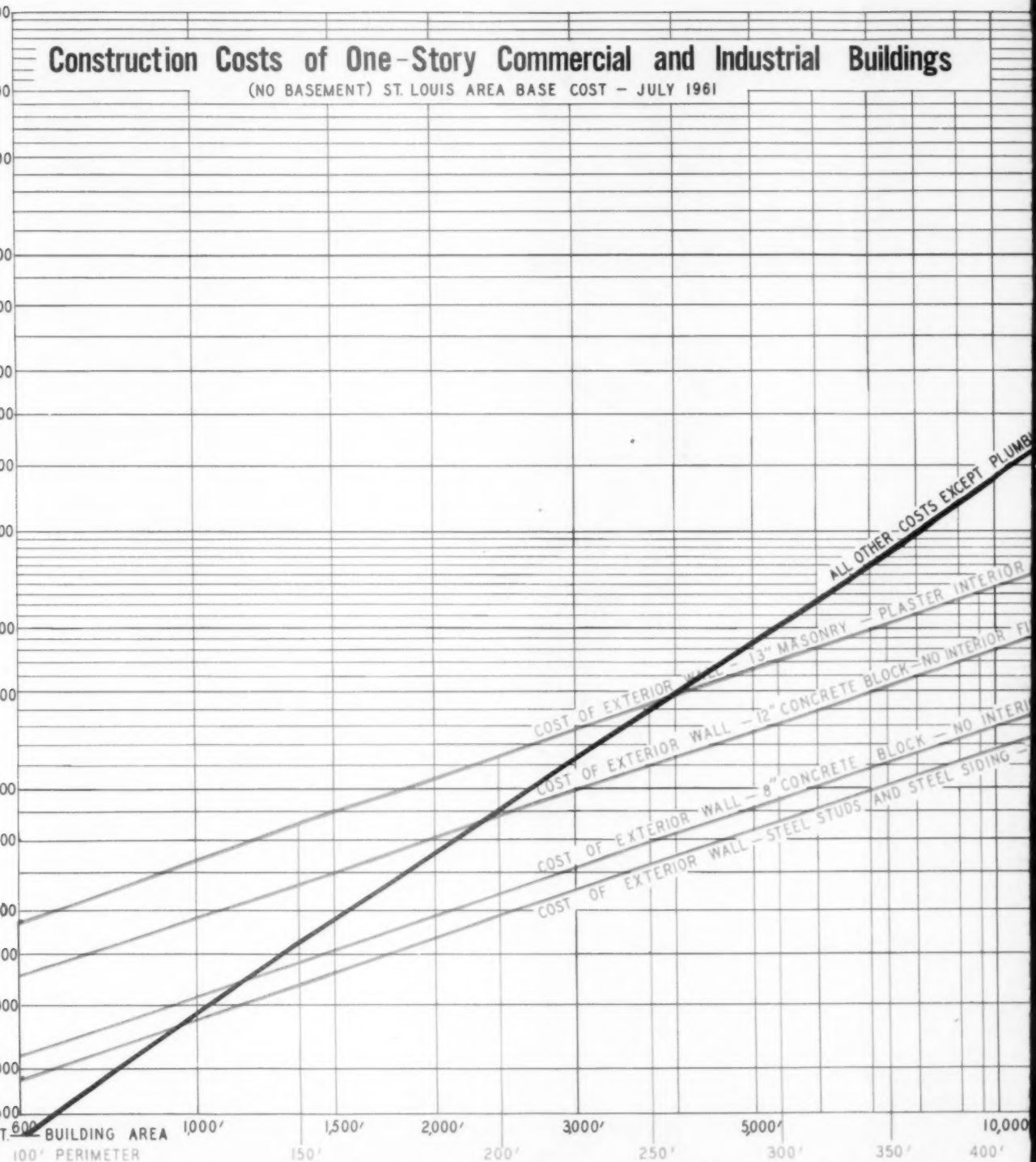
2. Asphalt tile floor. (Group C - 1/8-inch thick.)

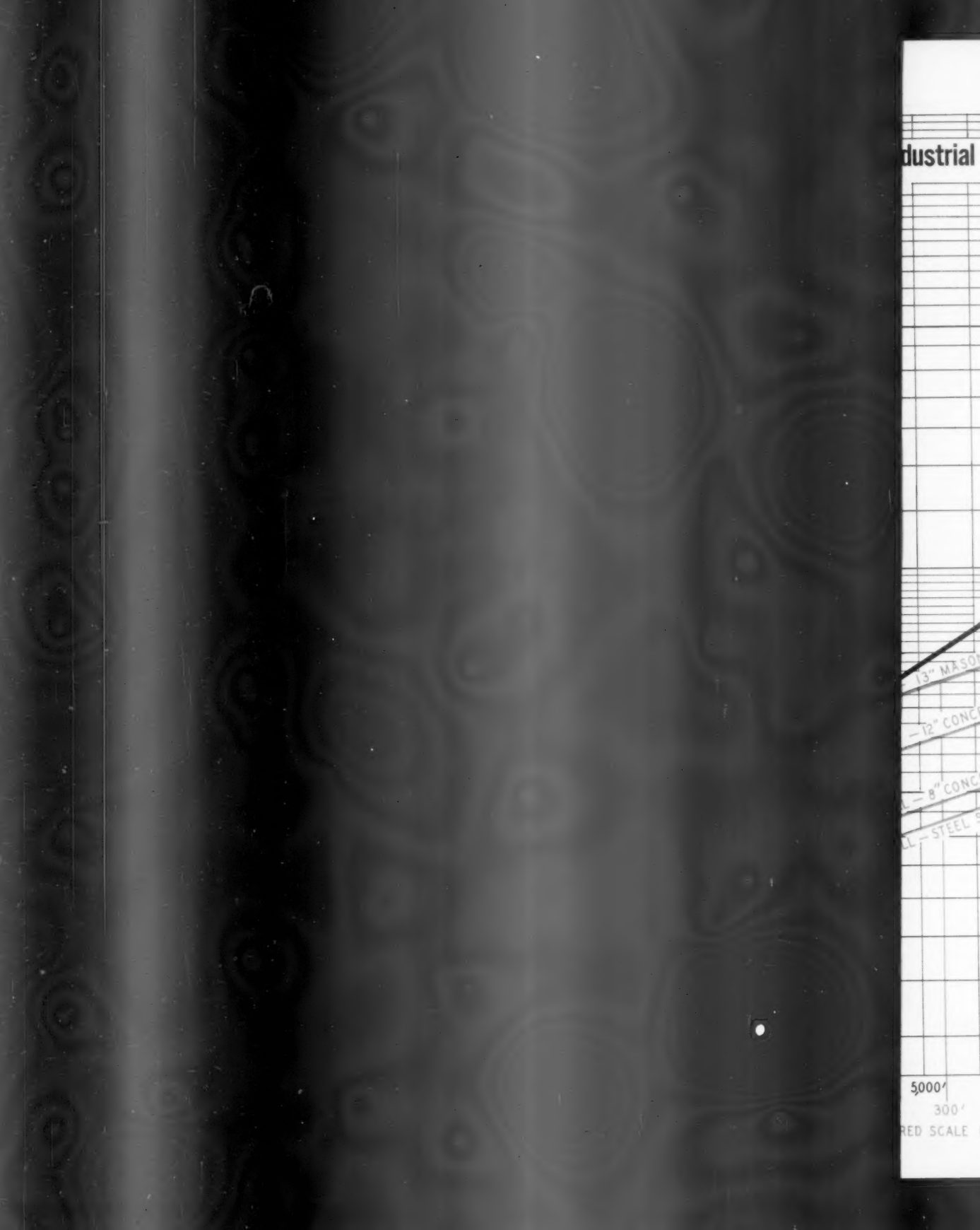
3. Masonry walls, 13 inches thick with face brick and concrete block back up.

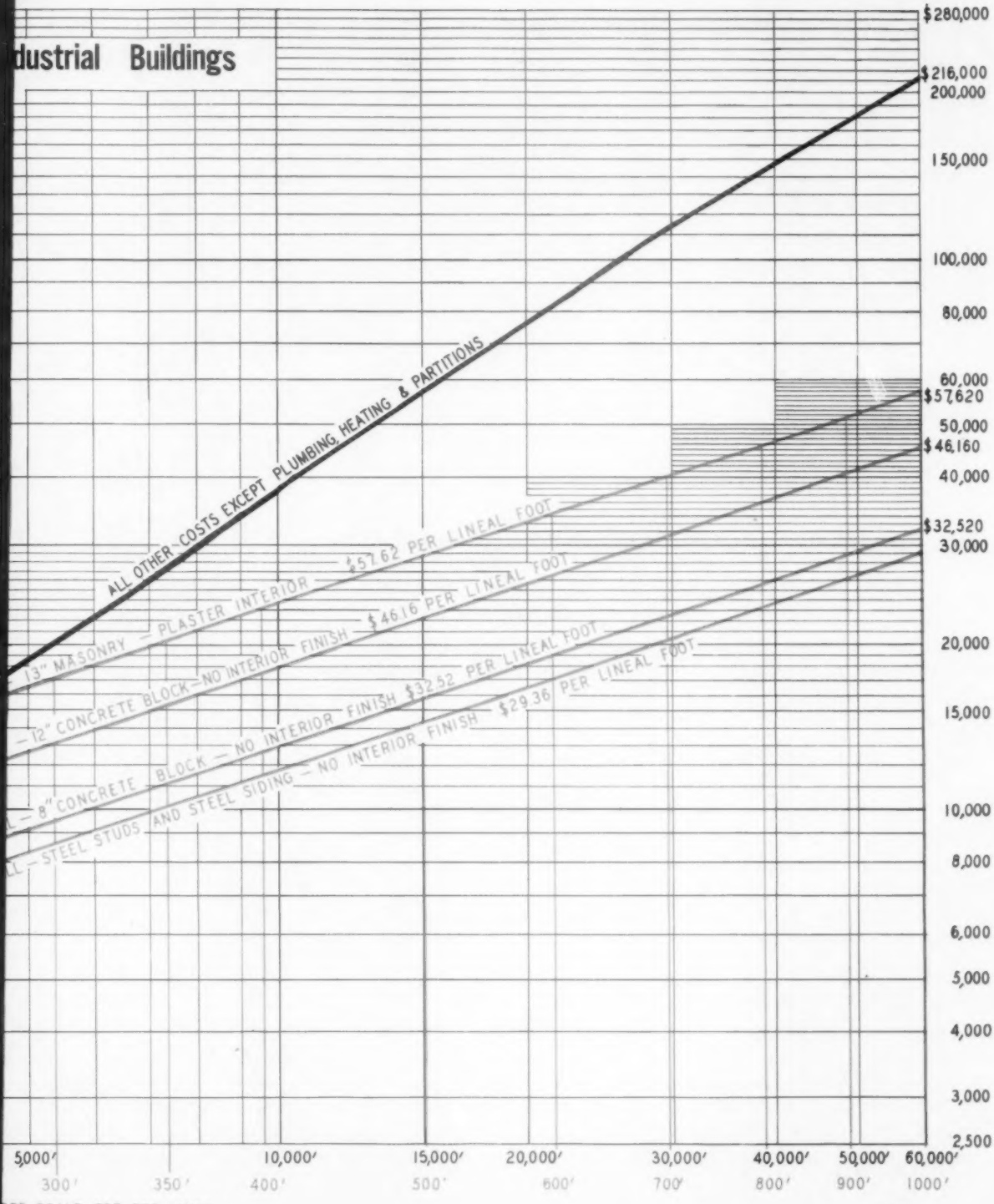


Construction Costs of One-Story Commercial and Industrial Buildings

(NO BASEMENT) ST. LOUIS AREA BASE COST – JULY 1961




dustrial
13" MASO
12" CONC
8" CONC
STEEL
5,000'
300'
RED SCALE



RED SCALE FOR RED LINES

4. Roof structure, 24-inch steel bar joists 4 feet 6 inches on center.
5. Plaster - three coats on walls.
6. Ceiling - aluminum grid with mineral fiber acoustic tile.
7. Insulation - 1-inch Fiberglas insulation board on roof deck.
8. Roof - 20-gauge steel roof decking with 15-year built up felt asphalt and gravel roofing.
9. Electrical system - metal or approved conduit with toggle type switches and approved metal outlet boxes. No appliances or fixtures are included in these costs nor is power wiring, which varies considerably and must be added separately.
10. Partitions are not included in charted base costs. Add as required. The table later in this report includes typical partition costs.
11. Plumbing and heating not included in charted base costs. Add as required. The table included later in this report includes typical plumbing and heating costs.
12. Air conditioning not included in base costs. Add as required.
13. Architect's fee of 6 percent for plans and specifications is included in the cost; architect's supervision fee is not included.
14. Ceiling height - 12 feet.

Typical plumbing, heating, and partitioning costs follow. Although they are not shown in the charts, they are shown in the table at the end of the report.

Plumbing

Plumbing service lines	$610
Average cost per fixture	226

A building less than 2,000 square feet would have not less than three fixtures, depending on use of the building. For the purpose of this bulletin, average needs are indicated. As the size of the building increases, the number of employees increases and the number of fixtures must increase accordingly.

Heating and Air Conditioning

Heating in a commercial or industrial building has a wide range of possible methods and attendant unit costs. Gas-fired unit space heaters can be installed for 35¢ per square foot of floor area. Radiant panel heating can be installed for $2 per square foot. Comfort and control are the deciding factors in selection of the type of heating facilities needed. For purposes of costs in this instance, a unit cost of 61¢ per square foot has been used.

There is also considerable range in cost for air conditioning. A good average system should cost in the neighborhood of $1.50 per square foot of floor area in addition to the heating cost.

Partitions

Interior partitions will vary in cost from 90¢ per square foot for ½-inch plasterboard on wood studs to $1.35 per square foot for metal lath and plaster on metal studs. Doors in interior partitions will cost about $2.65 per square foot or approximately $50 per opening. For the purpose of this bulletin, an average figure of $1.10 per square foot is used with one opening in every 40 lineal feet of wall = 12 x $1.10 x 40 = $13.20 x 40 = $528

1 door	50
Total cost, 40 lineal feet . .	$578

Therefore, average cost per lineal foot is $578 ÷ 40 feet = $14.45. For purposes of costs used here, 25 feet of partition are assumed for every 1,000 square feet of floor area.

The tabulation below shows a breakdown of the costs of charted building areas with and without plumbing, heating, and partitioning in the St. Louis area as of July 1961. City-by-city variations from St. Louis costs may be secured from Wenzlick's Residential Appraisal Manual or from area modifiers that will be published once a year in our regular published service.

BREAKDOWN OF COST OF ONE-STORY COMMERCIAL AND INDUSTRIAL BUILDING

Without Plumbing, Heating and Partitioning						With Plumbing, Heating and Partitioning			
Perimeter (Ft.)	Area (Sq. Ft.)	Perimeter Cost	Area Cost	Total Cost	Cost per Sq. Ft.	Plumbing and Heating	Partitions*	Total Cost	Cost per Sq. Ft.
100	600	$ 5,762	$ 2,316	$ 8,078	$13.46	$ 1,654	$ 216.75	$ 9,948.75	$16.58
150	1350	8,643	5,211	13,854	10.26	2,112	487.69	16,453.69	12.19
200	2400	11,524	9,264	20,788	8.66	3,204	867.00	24,859.00	10.36
250	3400	14,405	13,124	27,529	8.10	3,814	1,228.65	32,571.65	9.58
300	5000	17,286	18,800	36,086	7.22	5,242	1,806.25	43,134.25	8.63
350	6250	20,167	23,500	43,667	6.99	6,005	2,257.81	51,929.81	8.31
400	9600	23,048	35,520	58,568	6.10	8,726	3,468.00	70,762.00	7.37
500	13600	28,810	50,320	79,130	5.82	11,166	4,913.00	95,209.00	7.00
600	17600	34,572	64,592	99,164	5.63	14,058	6,358.00	119,580.00	6.79
700	27600	40,334	101,292	141,626	5.13	20,158	9,970.50	171,754.50	6.22
800	38400	46,096	140,160	186,256	4.85	27,198	13,872.00	227,326.00	5.92
900	46400	51,858	167,968	219,826	4.74	32,530	16,762.00	269,118.00	5.80
1000	60000	57,620	216,000	273,620	4.56	41,730	21,675.00	337,025.00	5.62

*For the purpose of this example, the partitioning is assumed to be 12 feet high.

The next issue of the Appraisal Bulletin will contain modifiers and refinements for correcting for deviations from these standard specifications.

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